Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381

May 12, 2017

10 CFR 50.73

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Watts Bar Nuclear Plant, Unit 2
Facility Operating License No. NPF-96
NRC Docket No. 50-391

Subject: **Licensee Event Report 391/2017-002-00, Manual Reactor Trip as a Result of a Secondary Plant Transient**

This submittal provides Licensee Event Report (LER) 391/2017-002-00. This LER provides details concerning a manual reactor trip that was performed after the loss of several secondary plant pumps. This report is being submitted in accordance with 10 CFR 50.73(a)(2)(iv)(A).

There are no regulatory commitments contained in this letter. Please direct any questions concerning this matter to Kim Hulvey, WBN Licensing Manager, at (423) 365-7720.

Respectfully,

Paul Simmons
Site Vice President
Watts Bar Nuclear Plant

Enclosure
cc: See Page 2

cc (Enclosure):

NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Watts Bar Nuclear Plant

NRC FORM 366 (06-2016) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2018

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

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4. TITLE

Manual Reactor Trip as a Result of a Secondary Plant Transient

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
03	20	2017	2017	- 002	- 00	05	12	2017	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
91	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
		☐ 50.73(a)(2)(i)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
Dean Baker, Licensing Engineer	423-452-4589

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO				

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On March 20, 2017 at 0813 Eastern Daylight Time (EDT), Watts Bar Nuclear Plant (WBN) Unit 2 operations personnel manually tripped the plant from approximately 91 percent power based on lowering steam generator levels. Prior to the plant trip, the 2A Hotwell pump tripped at 0759 EDT and the 2C Condensate Booster Pump subsequently tripped at 0803 EDT. Operations personnel commenced to lower plant power after the 2A Hotwell pump trip in an attempt to maintain steam generator levels, but were unable to recover level and manually tripped the unit.

All control rods fully inserted and all automatically actuated safety related equipment operated as designed. At 0905 EDT, operations personnel exited the emergency operating instructions after the plant was stabilized.

This event resulted when scaffold crews inadvertently depressed the local trip button for the 2A Hotwell pump, which resulted in the secondary system transient. Bump guard covers were subsequently installed on local pushbuttons for selected pumps in the turbine building.

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NARRATIVE

I. PLANT OPERATING CONDITIONS BEFORE THE EVENT

Watts Bar Nuclear Plant (WBN) Unit 2 was at 100 percent rated thermal power (RTP) prior to the secondary system transient.

II. DESCRIPTION OF EVENT

A. Event Summary

On March 20, 2017 at 0813 Eastern Daylight Time (EDT), Watts Bar Nuclear Plant (WBN) Unit 2 operations personnel manually tripped the plant from approximately 91 percent power based on lowering steam generator (SG){EIIS:SG} levels. Prior to the plant trip, the 2A Hotwell pump {EIIS:P}, a component of the condensate system {EIIS:SD}, tripped at 0759 EDT and the 2C Condensate Booster Pump subsequently tripped at 0803 EDT. Operations personnel commenced to lower plant power after the 2A Hotwell pump trip in an attempt to maintain steam generator levels, but were unable to recover level and manually tripped the unit.

All control rods fully inserted and all automatically actuated safety related equipment operated as designed. At 0905 EDT, operations personnel exited the emergency operating instructions after the plant was stabilized.

This event is being reported to the Nuclear Regulatory Commission (NRC) under 10 CFR 50.73(a)(2)(iv)(A) as a safety system actuation of the reactor protection system {EIIS:JC} and the auxiliary feedwater (AFW) system {EIIS:BA}.

B. Inoperable Structures, Components, or Systems that Contributed to the Event

No inoperable systems or components contributed to this report.

C. Dates and Approximate Times of Occurrences

Date	Time (EDT)	Event
3/20/2017	0759	Craft personnel inadvertently depressed local trip pushbutton for 2A Hotwell Pump
3/20/2017	0803	2C Condensate Booster pump tripped automatically
3/20/2017	0806	Operations enter 2-AOI-39, Rapid Load Reduction
3/20/2017	0811	2B Condensate Booster pump tripped on loss of Net Positive Suction Head (NPSH).
3/20/2017	0813	Operations personnel manually trip WBN Unit 2 at 91 percent RTP based on lowering SG levels. Main feedwater automatically isolated.
3/20/2017	0905	Operations personnel exit emergency operating instructions.

D. Manufacturer and Model Number of Components that Failed During the Event

None

E. Other Systems or Secondary Functions Affected

The inadvertent trip of the 2A Hotwell pump led to multiple secondary system pump trips on loss of NPSH.

F. Method of discovery of each Component or System Failure or Procedural Error

The inadvertent trip of the 2A Hotwell pump was discovered after the trip based on interviews with plant personnel.

G. Failure Mode and Effect of Each Failed Component

No components failed during this event.

H. Operator Actions

With SG levels lowering as a result of lost secondary pumps, operations personnel commenced a rapid load reduction and established a manual trip criteria based on SG level. SG levels were recovering when the 2B Condensate Booster pump was lost. With lowering SG levels the reactor was manually tripped above the SG low level alarm.

I. Automatically and Manually Initiated Safety System Responses

The reactor was manually tripped and the AFW system automatically actuated. All safety systems operated as expected.

III. CAUSE OF THE EVENT

A. The cause of each component or system failure or personnel error, if known.

The plant trip was a result of scaffold workers inadvertently depressing the local trip pushbutton for the 2A Hotwell pump.

B. The cause(s) and circumstances for each human performance related root cause.

The plant trip was a result of scaffold workers inadvertently depressing the local trip pushbutton for the 2A Hotwell pump. These workers did not display appropriate situational awareness around trip sensitive equipment. Operations personnel did not establish proper controls for work being performed on WBN Unit 2 while WBN Unit 1 was in an outage.

IV. ANALYSIS OF THE EVENT

The inadvertent trip of the 2A Hotwell pump resulted in reduced suction head to downstream pumps, resulting in additional pump trips on low suction pressure. This resulted in reduced feedwater flow and lowering SG levels. Operations commenced a rapid downpower to address lowering SG levels, but

multiple pump trips led to the decision to manually trip the plant rather than wait for an automatic plant trip. All safety systems operated as expected. While main feedwater isolated by design, it was recoverable using normal plant procedures. This trip is considered to be uncomplicated.

V. ASSESSMENT OF SAFETY CONSEQUENCES

The event resulted from an inadvertent trip of the 2A Hotwell pump, which led to other secondary pumps tripping due to a loss of NPSH. The resultant secondary plant transient required a manual plant trip. The event that occurred is bounded by the Loss of Normal Feedwater event described in the Final Safety Analysis Report (FSAR), which is considered an anticipated operational occurrence.

A. Availability of systems or components that could have performed the same function as the components and systems that failed during the event

All safety systems operated as designed during this event.

B. For events that occurred when the reactor was shut down, availability of systems or components needed to shutdown the reactor and maintain safe shutdown conditions, remove residual heat, control the release of radioactive material, or mitigate the consequences of an accident

Not applicable.

C. For failure that rendered a train of a safety system inoperable, an estimate of the elapsed time from the discovery of the failure until the train was returned to service

All safety systems operated as designed during this event.

VI. CORRECTIVE ACTIONS

This event was entered into the Tennessee Valley Authority (TVA) Corrective Action Program and is being tracked under Condition Reports (CRs) 1274558, 1274800, and 1275064.

A. Immediate Corrective Actions

Upon determining the nature of the human performance error, coaching was provided to site construction personnel related to situational awareness around trip sensitive equipment. Additional controls were specified for field personnel working on an operating unit while the adjacent unit was in an outage.

B. Corrective Actions to Prevent Recurrence or to Reduce Probability of Similar Events Occurring in the Future

Operations personnel were coached on the need to control work activities near operating equipment. Bump guard covers were installed on local pushbuttons for a number of secondary pumps in the turbine building to prevent inadvertent actuation.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

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NARRATIVE

VII. PREVIOUS SIMILAR EVENTS AT THE SAME SITE

A plant trip due to loss of main feedwater was reported to the NRC in LER 391/2016-005 dated August 19, 2016. This event was attributed to operations personnel failing to precisely control the plant, resulting in a loss of vacuum to the main feedwater pump condenser. The event described in this LER is different in that it involved an inadvertent equipment contact by non-operations personnel.

VIII. ADDITIONAL INFORMATION

None.

IX. COMMITMENTS

None.